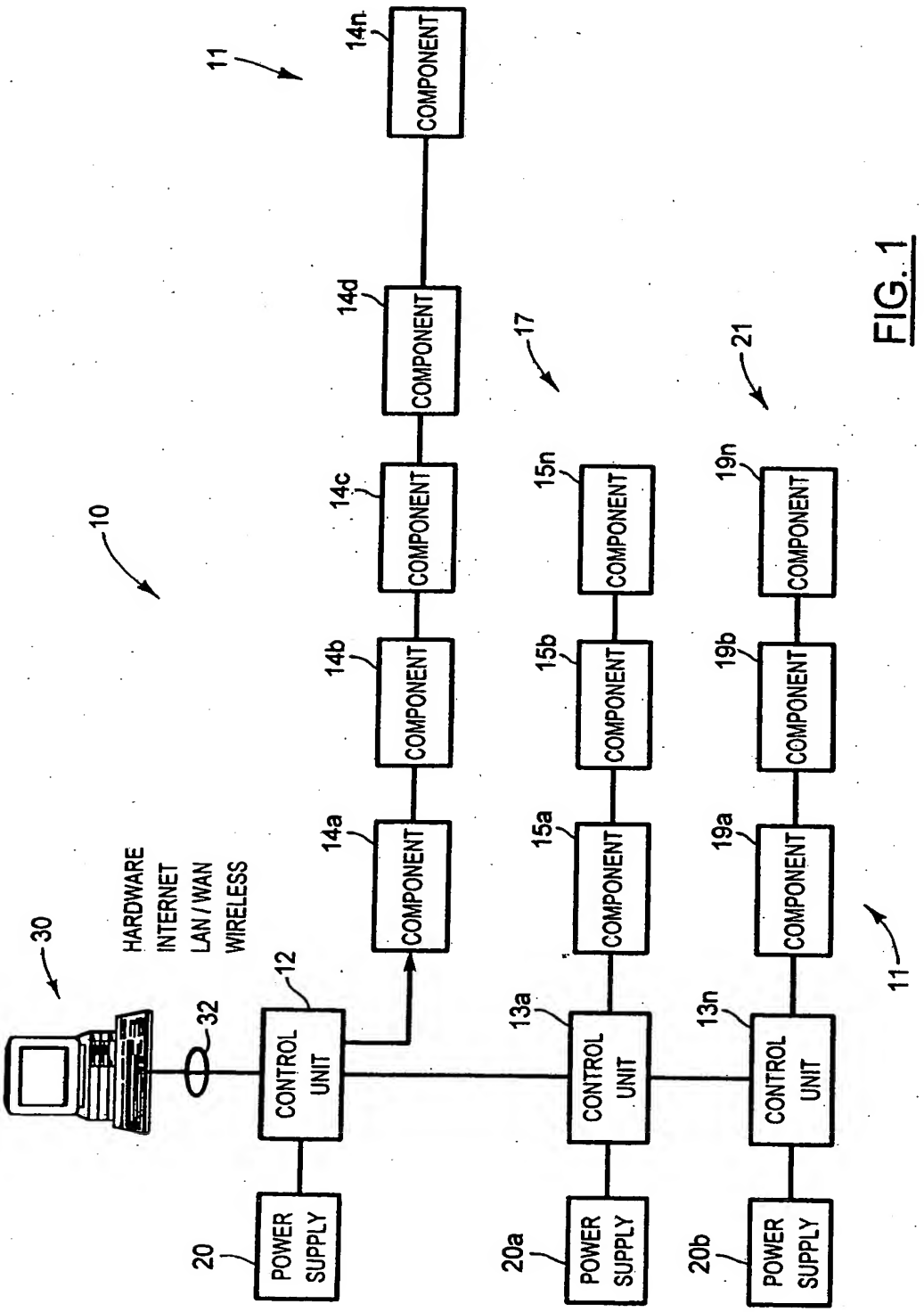
10
11
11
12
13a
13n
14a
14b
14c
14d
14n
15a
15b
15n
17
19a
19b
19n
20
20a
20b
21
30
32
HARDWARE
INTERNET
LAN / WAN
WIRELESS
CONTROL UNIT
CONTROL UNIT
CONTROL UNIT
POWER SUPPLY
POWER SUPPLY
POWER SUPPLY
COMPONENT
COMPONENT
COMPONENT
COMPONENT
COMPONENT
COMPONENT
COMPONENT
COMPONENT
COMPONENT
COMPONENT

FIG. 1

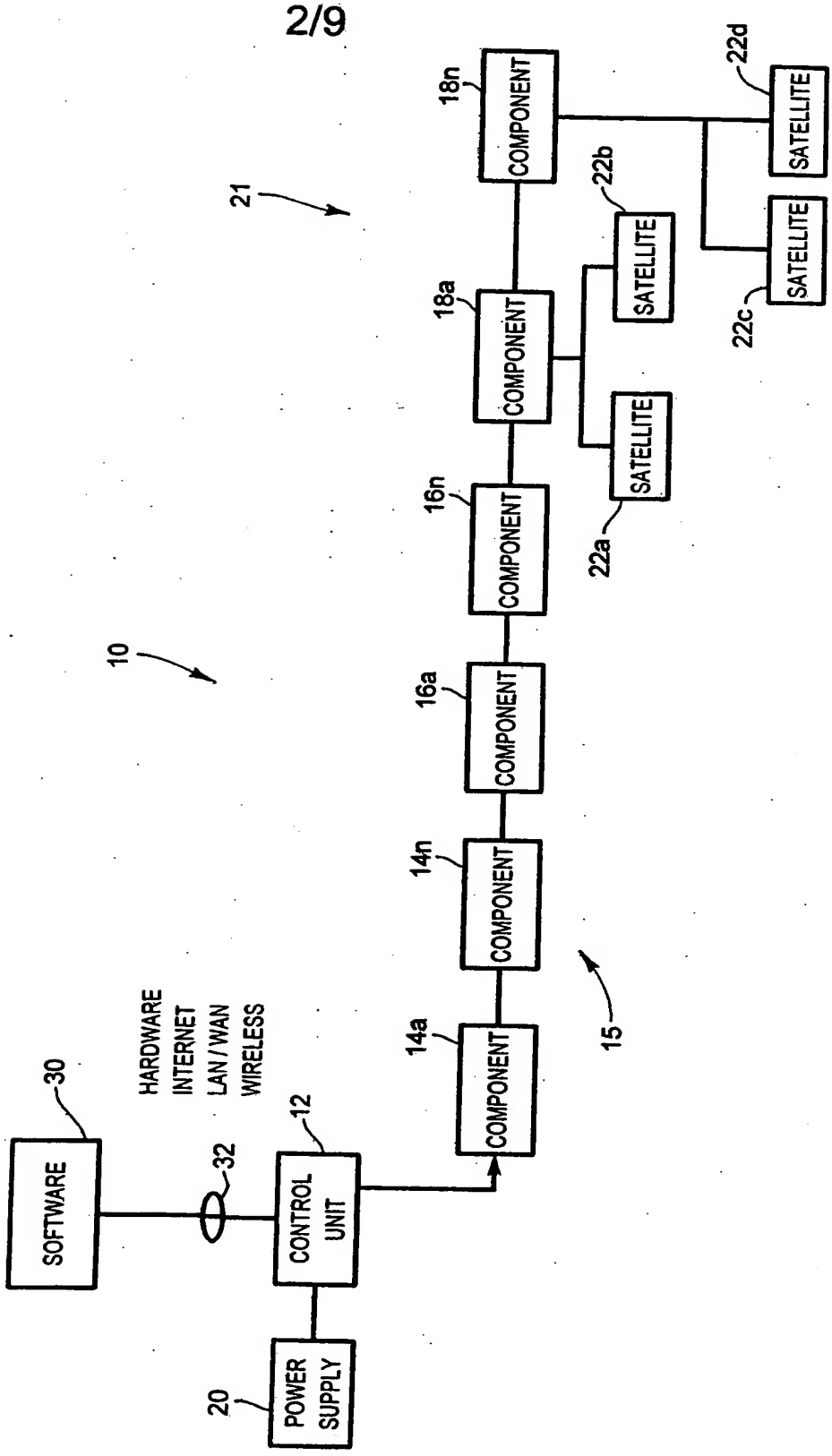
10
21
15
SOFTWARE
30
HARDWARE
INTERNET
LAN / WAN
WIRELESS
32
CONTROL UNIT
12
POWER SUPPLY
20
14a
COMPONENT
14n
COMPONENT
16a
COMPONENT
16n
COMPONENT
18a
COMPONENT
18n
COMPONENT
22a
SATELLITE
22b
SATELLITE
22c
SATELLITE
22d
SATELLITE

FIG. 2

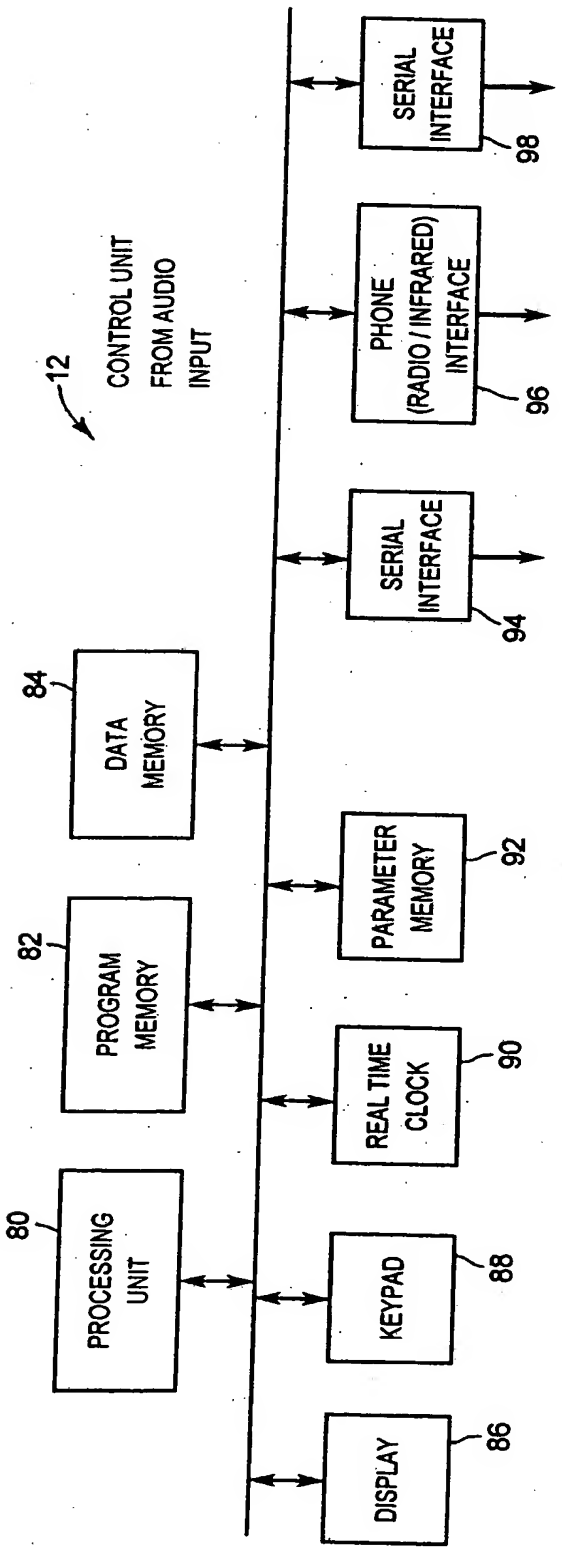
12
CONTROL UNIT FROM AUDIO INPUT
SERIAL INTERFACE
98
PHONE (RADIO / INFRARED) INTERFACE
96
SERIAL INTERFACE
94
84
DATA MEMORY
PARAMETER MEMORY
92
82
PROGRAM MEMORY
REAL TIME CLOCK
90
80
PROCESSING UNIT
KEYPAD
88
DISPLAY
86

FIG. 3

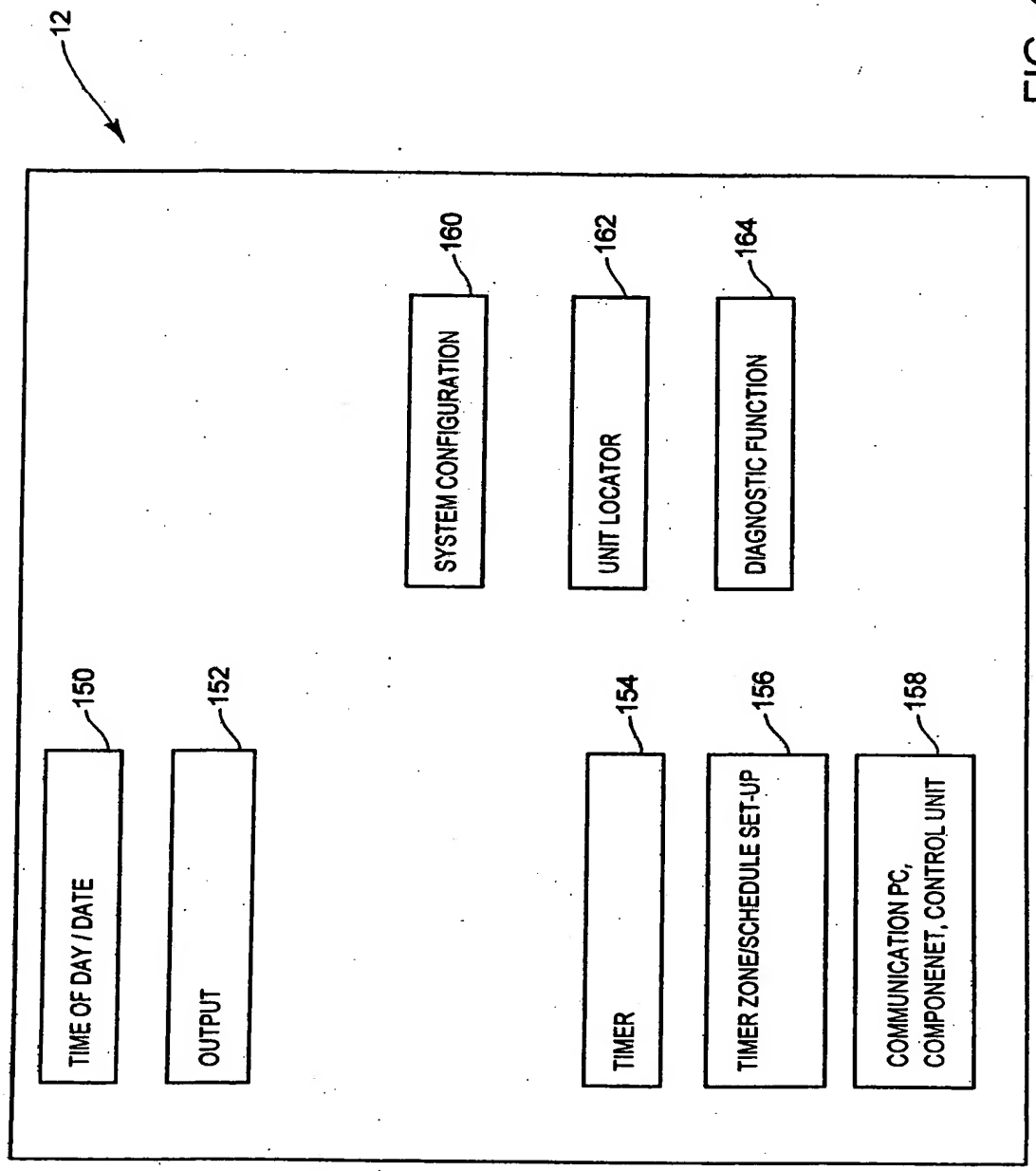
12
160
SYSTEM CONFIGURATION
162
UNIT LOCATOR
164
DIAGNOSTIC FUNCTION
150
TIME OF DAY / DATE
152
OUTPUT
154
TIMER
156
TIMER ZONE/SCHEDULE SET-UP
158
COMMUNICATION PC, COMPONENET, CONTROL UNIT

FIG. 4

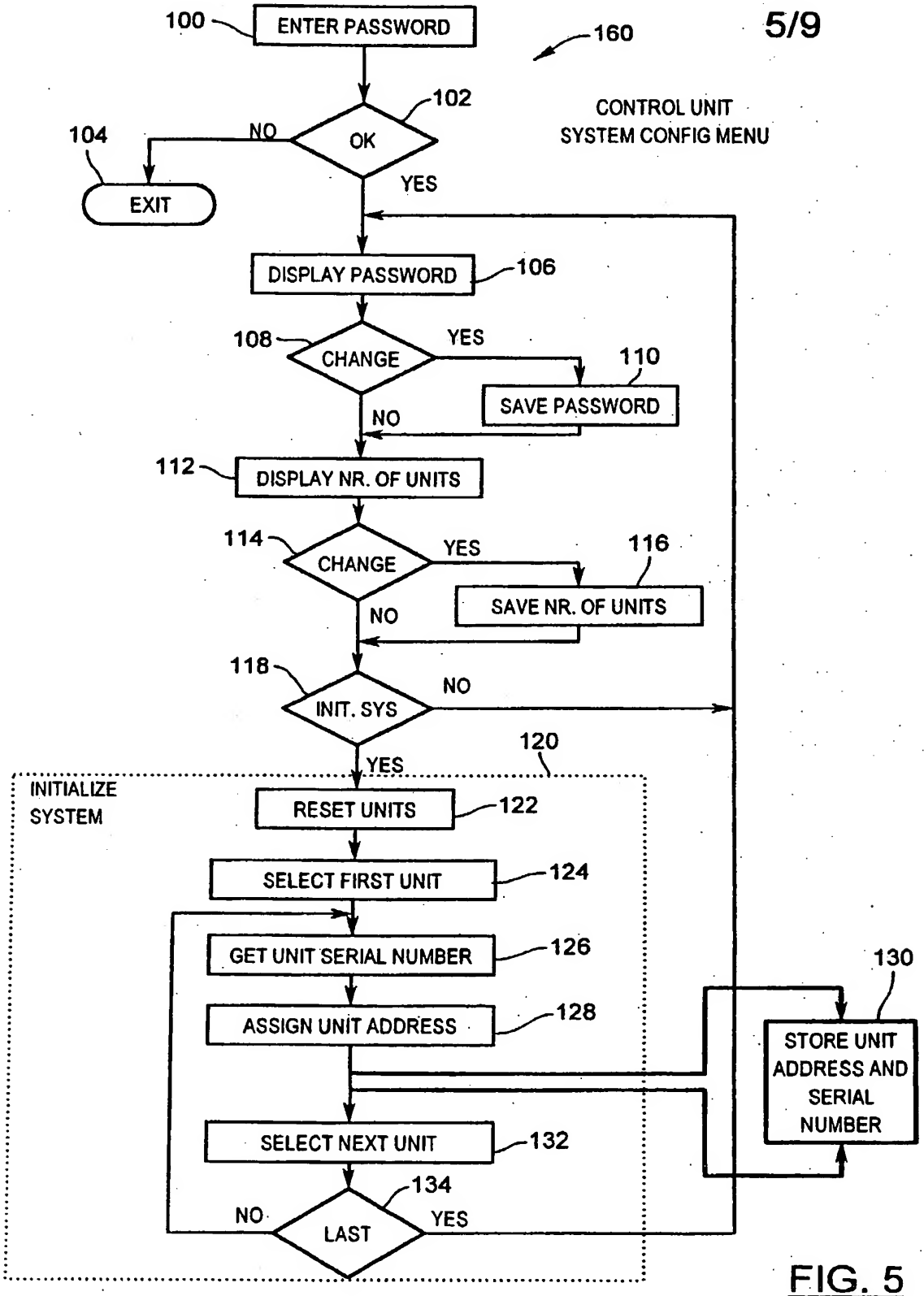
100
ENTER PASSWORD
160
CONTROL UNIT
SYSTEM CONFIG MENU
102
OK
NO
104
EXIT
YES
DISPLAY PASSWORD
106
108
CHANGE
YES
110
SAVE PASSWORD
NO
112
DISPLAY NR. OF UNITS
114
CHANGE
YES
116
SAVE NR. OF UNITS
NO
118
INIT. SYS
NO
120
YES
INITIALIZE SYSTEM
RESET UNITS
122
SELECT FIRST UNIT
124
GET UNIT SERIAL NUMBER
126
ASSIGN UNIT ADDRESS
128
130
STORE UNIT ADDRESS AND SERIAL NUMBER
SELECT NEXT UNIT
132
134
NO
LAST
YES

FIG. 5

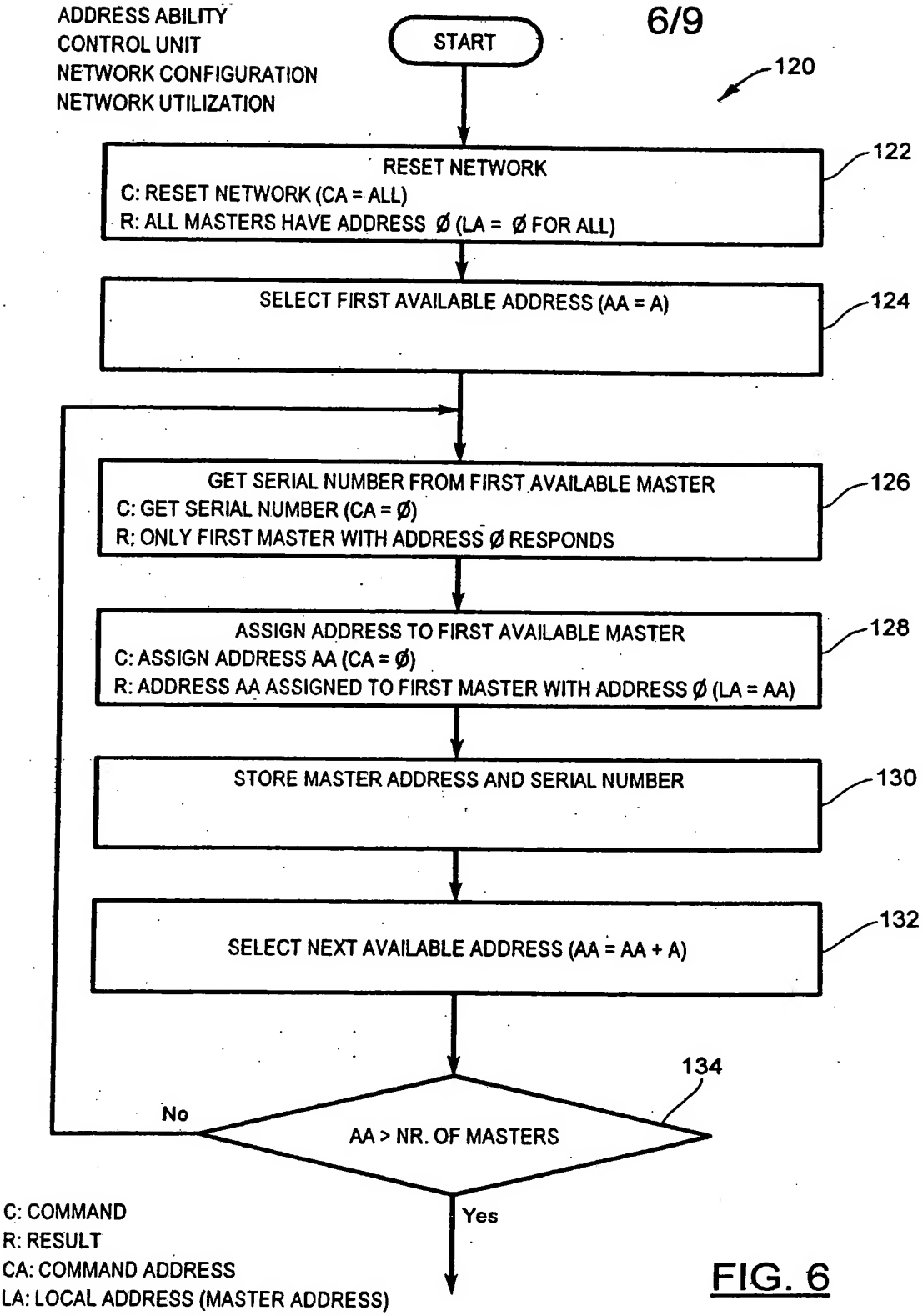
ADDRESS ABILITY
CONTROL UNIT
NETWORK CONFIGURATION
NETWORK UTILIZATION
START
120
RESET NETWORK
C: RESET NETWORK (CA = ALL)
R: ALL MASTERS HAVE ADDRESS Ø (LA = Ø FOR ALL)
122
SELECT FIRST AVAILABLE ADDRESS (AA = A)
124
GET SERIAL NUMBER FROM FIRST AVAILABLE MASTER
C: GET SERIAL NUMBER (CA = Ø)
R: ONLY FIRST MASTER WITH ADDRESS Ø RESPONDS
126
ASSIGN ADDRESS TO FIRST AVAILABLE MASTER
C: ASSIGN ADDRESS AA (CA = Ø)
R: ADDRESS AA ASSIGNED TO FIRST MASTER WITH ADDRESS Ø (LA = AA)
128
STORE MASTER ADDRESS AND SERIAL NUMBER
130
SELECT NEXT AVAILABLE ADDRESS (AA = AA + A)
132
134
No
AA > NR. OF MASTERS
Yes
C: COMMAND
R: RESULT
CA: COMMAND ADDRESS
LA: LOCAL ADDRESS (MASTER ADDRESS)

FIG. 6

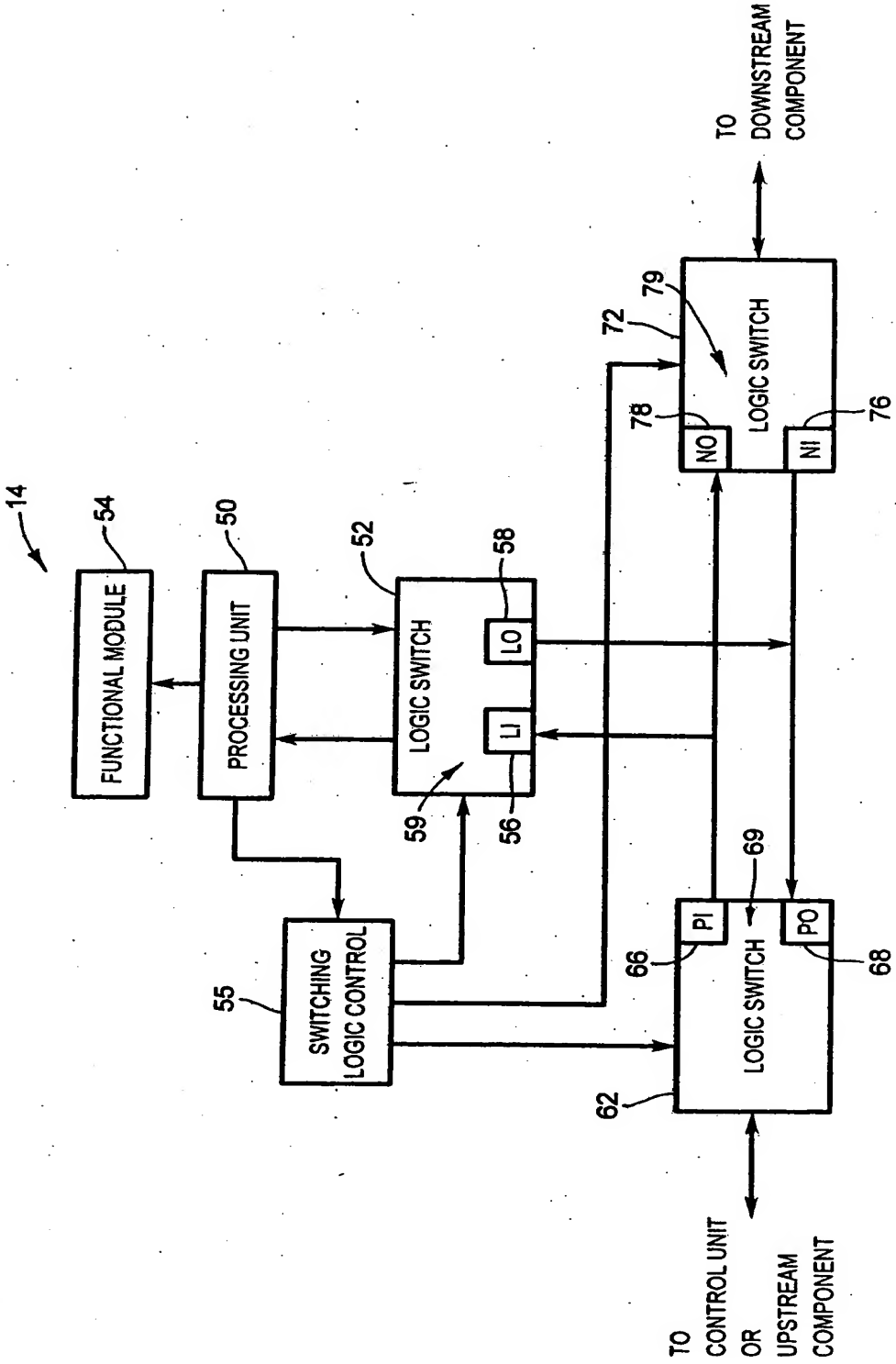
14
54
FUNCTIONAL MODULE
50
PROCESSING UNIT
52
LOGIC SWITCH
58
LO
LI
59
56
55
SWITCHING LOGIC CONTROL
72
79
LOGIC SWITCH
78
NO
NI
76
TO DOWNSTREAM COMPONENT
69
PI
PO
66
68
LOGIC SWITCH
62
TO CONTROL UNIT OR UPSTREAM COMPONENT

FIG. 7

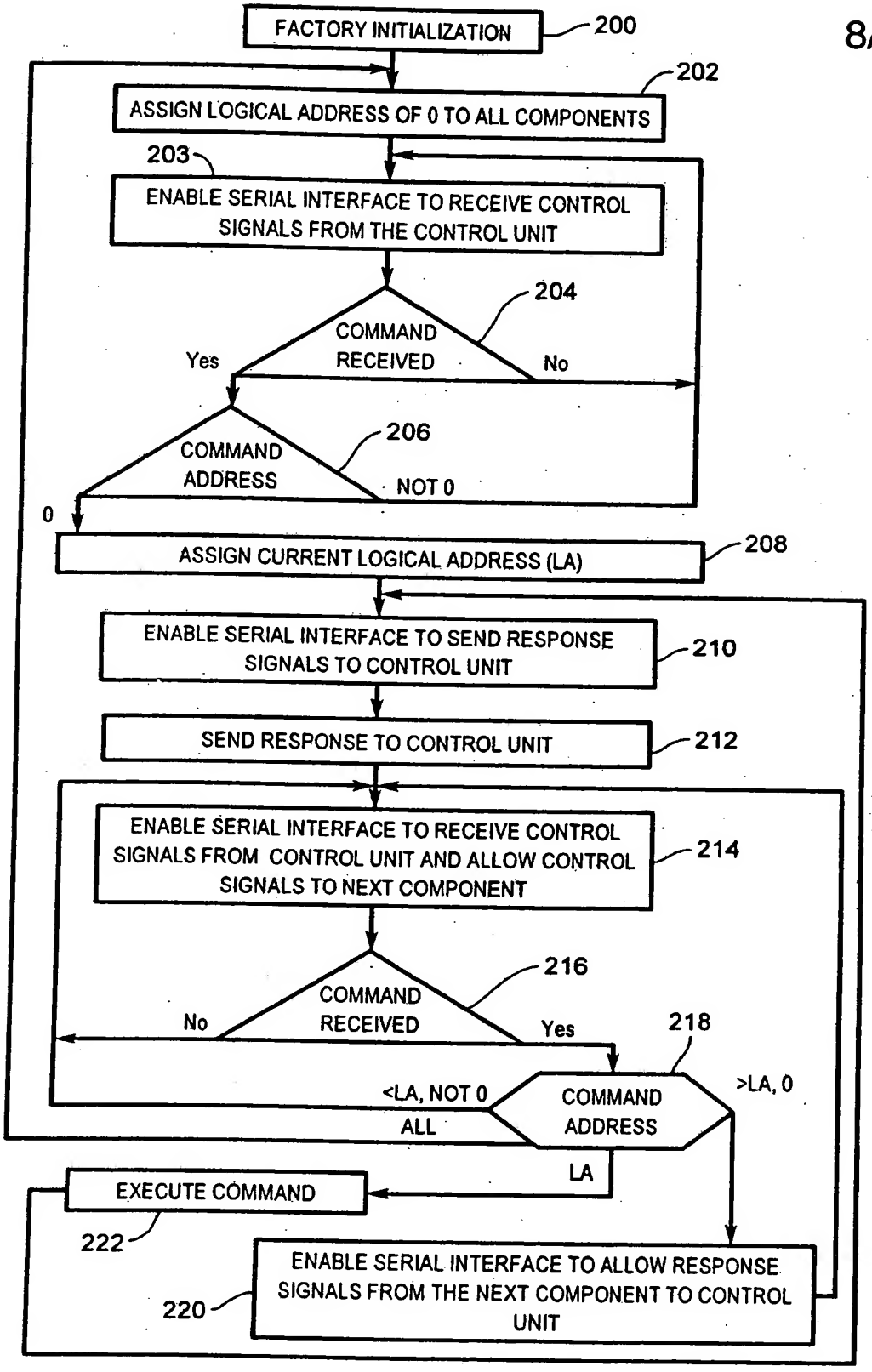
FACTORY INITIALIZATION
200
ASSIGN LOGICAL ADDRESS OF 0 TO ALL COMPONENTS
202
203
ENABLE SERIAL INTERFACE TO RECEIVE CONTROL SIGNALS FROM THE CONTROL UNIT
204
COMMAND RECEIVED
Yes
No
206
COMMAND ADDRESS
NOT 0
0
ASSIGN CURRENT LOGICAL ADDRESS (LA)
208
ENABLE SERIAL INTERFACE TO SEND RESPONSE SIGNALS TO CONTROL UNIT
210
SEND RESPONSE TO CONTROL UNIT
212
ENABLE SERIAL INTERFACE TO RECEIVE CONTROL SIGNALS FROM CONTROL UNIT AND ALLOW CONTROL SIGNALS TO NEXT COMPONENT
214
216
COMMAND RECEIVED
No
Yes
218
<LA, NOT 0
ALL
COMMAND ADDRESS
>LA, 0
LA
EXECUTE COMMAND
222
ENABLE SERIAL INTERFACE TO ALLOW RESPONSE SIGNALS FROM THE NEXT COMPONENT TO CONTROL UNIT
220

FIG. 8

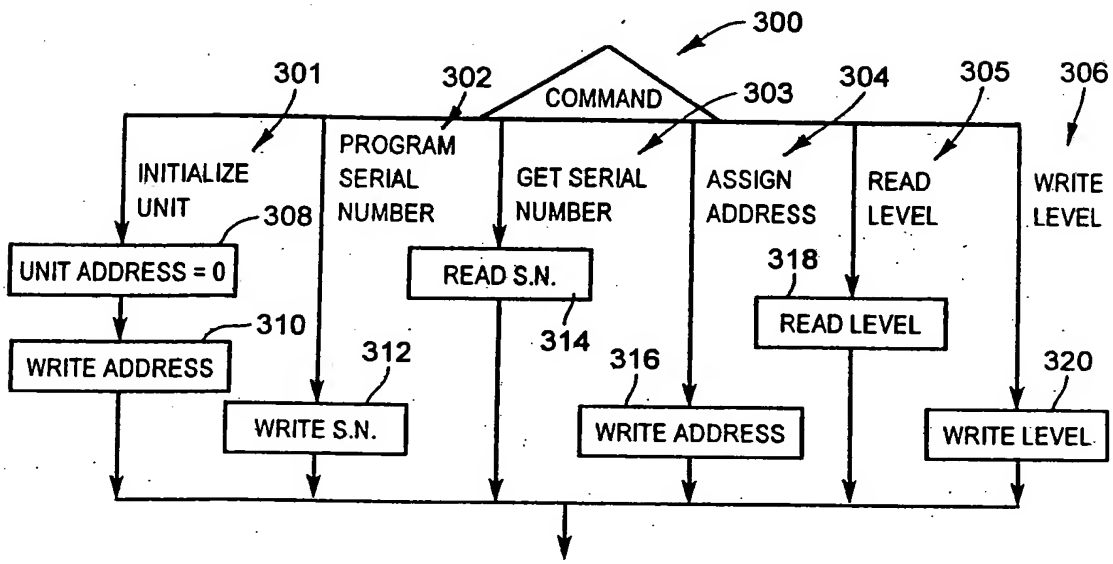
300
301
302
COMMAND
303
304
305
306
INITIALIZE UNIT
PROGRAM SERIAL NUMBER
GET SERIAL NUMBER
ASSIGN ADDRESS
READ LEVEL
WRITE LEVEL
308
UNIT ADDRESS = 0
READ S.N.
318
READ LEVEL
310
WRITE ADDRESS
312
314
316
320
WRITE S.N.
WRITE ADDRESS
WRITE LEVEL

FIG. 9